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TOWARD MORE EFFECTIVE REGULATION

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ABSTRACT

This paper proposes a model relationship between the operator engaged in a hazardous activity, the regulator of that activity, and the general public. The roles and responsibilities of each entity are described in a way that allows effective communication flow. The role of the regulator is developed using the steam boiler as an example of a hazard subject to regulation; however, the model applies to any regulated activity. In this model the safety analyst has the extremely important role of communicating sometimes difficult technical information to the regulator in a way that the regulator can provide credible assurance to the general public as to the adequacy of the control of the hazardous activity. The conclusion asserts that acceptance of he model, understanding of the roles and responsibilities and definition of who communicates what information to whom will mitigate frustration on the part of each of the three entities.

Introduction

Common sense is dead. The regulations are written for those too stupid to do the right thing on their own. There is constant ratcheting of the requirements. No matter how detailed the Safety Analysis Report the regulator wants more analysis. No matter how low the risk, somebody wants it lower. Ever more expensive analyses pursue ever smaller and smaller risks.

There have been many calls for regulatory reform over the last few years. Some take the form of ridicule of the existing system, pointing out the absurd conclusions arrived at by implementing well-intended regulations. Others have called for re-engineering government with the view that citizens are to be considered as the "customers" of government. In the following I will take the approach of "back to basics." It's time to look at what we are trying to accomplish and make the solution actually relate to the objective.

Common Sense

Many of you will recall a book entitled, "The Death of Common Sense, How Law is Suffocating America" by Philip Howard[A]. Howard uses ridicule to point out significant flaws in existing regulations. He tells of the Nuns of the Missionaries of Charity who were looking for an abandoned building in New York City that they could convert into a shelter for the homeless. None other than Mother Theresa, the head of the order, had met with Mayor Ed Koch to get agreement on the plan. The city would provide the building and the nuns had raised a half a million for renovation. It looked like win-win. But the nuns take a vow of poverty. In addition, these nuns use no modern conveniences. New York's building code, they were told, after almost two years, requires an elevator in every new or renovated multiple-story building. The Missionaries of Charity explained that because of their beliefs they would never use the elevator, which would cost them $100,000. They thought the money better used for soup, but were informed the law could not be waived. The Missionaries of Charity sent their regrets on the project to the City of New York in a politely worded letter noting that the episode "served to educate us about the law and its many complexities."

The law was aspiring to raise the standard of living. But it served to satisfy middle-class standards with

either a model home or no home. What about those trying to provide housing for the poor? The needs of some of New York's citizens were met, but those of many others were harmed. The regulator in this case was notably absent; replaced with a code.

Re-inventing Government

Another approach to regulatory reform has been to "reinvent" government. In his book called, "Businesslike Government[B]," Vice-President Al Gore says, "Regulators are more effective in partnership with industry." To many Americans in regulated industries, it must have seemed that government thought they were evil. Consider this quote from a manual for federal regulators: "All regulatory processes are designed to discover and develop evidence of violations." Far too often, regulatory agencies focused only on finding violators, rather than preventing problems. This attitude was reinforced by the incentive system. "Success" in the regulatory world meant finding the most violations and issuing the highest fines. Government told business exactly what to do, and how to do it – all specified in thousands of detailed, often-incomprehensible rules and regulations. Then the regulatory agencies spent their time trying to catch companies when they made a mistake. One agency even referred to those it monitored as "suspects."

Regulators can help industry achieve compliance through training and education, by sharing best practices and by developing consensual approaches and encouraging innovation. Regulators need to work in partnership with industry and communities to design regulatory processes…. American society has been organized around top-down, command-and-control models. In case after case, regulatory agencies are discovering they can do better with partnerships than without them. Programs such as the OSHA VPP and INPO in the nuclear industry have served to improve safety performance in the workplace, make the regulations a better match to the industry and to aid the regulator. So partnerships can work – the results speak for themselves.

Regulation of Steam Boilers[C]

During the early years of the 1800's, at the height of the Age of Steam and the industrial revolution, deaths and injuries caused by boiler explosions were a commonplace and daily occurrence in industry. As many as two or three boiler explosions a week were not unusual. These tragic accidents were caused by a general lack of understanding of the properties of steam and of the materials used in boiler construction. Among the problems boiler manufacturers faced were a limited knowledge of metallurgy and a lack of competent design engineers. Most industrial states had boiler construction rules for their own jurisdictions; what was lacking was one dependable, uniform construction code, which could be accepted in all of the states.

By mid-century, more steam at greater pressure was needed to meet the demands of industry. As larger and larger boilers were built, frequent accidents caused shocking loss of life. In 1865 a boiler explosion on board the riverboat "Sultana" caused the death of 1,238 passengers; mostly Union soldiers returning home from the Civil War. These kinds of great disasters created a public demand for safer and stronger boilers.

In 1866, Hartford Steam Boiler Inspection and Insurance Company was formed. Hartford developed the concept of insuring an object against loss, and inspecting the object for safety. By 1879 Hartford had begun supervising construction and installation of boilers, and had written a widely accepted boiler construction standard known as the "Uniform Steam Boiler Specifications." The boiler safety industry

was begun in the United States by insurance companies working in concert with boiler manufacturers to produce a safe and reliable product.

The American Society of Mechanical Engineers (ASME) was organized in 1880, and in 1914 wrote the first American "Boiler and Pressure Vessel Code". This Code is now accepted worldwide as a standard for pressure equipment construction.

Creation of the ASME Code was only half the battle; without adoption and enforcement by the individual States, the Code lacked the full force of law. The Chief Boiler Inspectors of the United States and of the Canadian Provinces recognized the need for uniform adoption and enforcement of the ASME Code, and in 1919 the National Board of Boiler and Pressure Vessel Inspectors was formed. Today, members of the National Board regulate the construction, repair and inspection of boilers and pressure vessels throughout the United States and Canada.

In this example there are three parties whose interests need to be satisfied, the manufacturers, the public and the regulators. Initially the industry itself was the regulator. The industry worked with a third party, the insurance company to develop a reasonable standard that reduced the risk of a boiler explosion. The interests of the public were addressed but it wasn't enough because not everyone was included. Eventually laws were passed requiring all manufacturers to participate and a board of regulators was created.

It is worth noting that the most effective regulation occurred when the industry worked with a third party (insurance at first and then an industrial society, ASME) to self regulate. This is the model favored today as exemplified by ISO-9000, OSHA VPP and INPO. In each case the industry agrees to work to consensus standards and a third party (a regulator) oversees and agrees that the standard is being met.

Status quo

We find ourselves in a regulated business. We're in a regulated business because we deal with hazards that are not commonly understood and accepted. The situation is really not too much different from the example of the steam boiler. We tend to think of DOE facilities as difficult for the average person to understand. But so are the properties of steam and the materials used in boiler construction. Maybe better understanding would make them more acceptable. But maybe not and we still have to deal with the acceptability whether or not they are understood. Further, a trustworthy third party seems to be a necessary ingredient; a third party backed up with a legal mandate.

The logic goes something like this:

1. We work with hazardous materials or operations.
2. There is some benefit from working with these hazards (else we'd just avoid them).
3. We need acceptance from the general public to this work.
4. The public wants to be protected from the hazards.
5. The public doesn't understand the hazards or the risks.
6. The public might accept assurance that they are being protected from a third party that they trust.
7. That third party would have to be knowledgeable of the hazard, and
8. The third party would have to consider the best interests of the public.
9. The public would have to be convinced that their interests are being considered and that the third party is knowledgeable.
10. The third party must want to balance the conditions placed on the work and risks so that the benefits of the work can be realized.

Suppose we call the third party the "regulator." Suppose the regulator meets the criterion of being

knowledgeable and of acting in the best interest of the public. Suppose the public is "assured" by this process. Then regulation of the hazard is effective, the work can proceed under the conditions specified by the regulator, and the benefits are realized.

The regulation of steam boilers is an example of the forces that come into play and how the "regulator" balances those forces. It has all the elements we're looking for; a hazard, public demand for control of the hazard, and the evolution to a regulator to resolve the issue. The key to effective regulation of a hazardous activity is a clear understanding of the role played by the engineer, the regulator and the general public.

The engineer's role in relation to the regulator and the general public needs to be explored in detail. Engineers function best when immersed in the technical and analytical aspects of the field. In this they are like the artist. The pursuit of technical excellence is its own reward. However the product must sell. Artists seem to thrive on starvation. Engineers don't. Thus the engineer must not only create a technically excellent product he(she) must also worry about the whims of the fickle public.

The same is true of the Safety Analyst, but the connection to the public is not as apparent. The Safety Analyst must satisfy the regulator who in turn must satisfy the public. Thus a special relationship is established between the engineer and the regulator and between the regulator and the public.

Three parties need to be defined and have their roles and responsibilities characterized: the engineer (Safety Analyst), the regulator and the general public. In this context, the engineer, safety analyst, manufacturer and operator are all considered to represent the industry.

The Role of the Engineer (or Safety Analyst)

The engineer's first obligation is to the work. It must be of high quality. Integrity and honesty are essential elements. The engineer also has the responsibility to work to standards. Not only does the design or the analysis need to meet the standard it needs to be easy to compared to the standard. Given alternative designs of comparable safety performance, if one is easy to show it meets the standard and one is difficult, choosing the easier one may be in the overall best interest of the project.

The engineer also has to work effectively with the regulator. The regulator needs help in developing effective standards, in communicating the standards to the public, and in demonstrating adherence to the standards. The engineer has to help the regulator be effective. This means educating the regulator, developing clear comparison to the standards, developing credibility with the regulator and developing the credibility of the regulator. One can envision a great design that is never implemented because it can't gain acceptance.

In relation to the public, the engineer has to consider the standards as a contract with the public. Compliance can be a good thing if it means the public understands you are meeting the terms of the contract. The engineer should communicate to the public through the regulator. Attempting to argue hazard and risk acceptability with the public is likely to be frustrating. Arguing with the regulator in public is likely to be counter-productive.

The Role of the Regulator

Being an effective regulator is basically a balancing act. The regulator's first obligation is to balance the needs of the public and the benefits of the activity. The regulator must avoid becoming an advocate either

for the public or for the industry. The regulator has to understand the needs of the public and understand the technology being regulated. The regulator has to develop credibility both with the public and with the industry by assuring the hazards are mitigated and the provisions of the standards are met.

The regulator has to work effectively with both the engineer and with the public. This is where the hard (technical) sciences and the social sciences meet. The regulator has to develop a close working relationship with the engineer in order to understand the technology and to understand its application relative to the standard. The regulator also has to develop standards that both effectively mitigate the hazard and can be explained to the public.

In relation to the public, the regulator has to communicate effectively. The regulator has to gauge the needs of society and assure the standards address those needs. The regulator has to know when the standards are being met and be able to convey that knowledge in a convincing way. If the standards are considered a contract with the public, then the regulator has to be able to demonstrate that the terms of the contract are being met.

Because of the unique position the regulator has in bridging between society and technology, it is sometimes temping for the regulator to become an advocate for some social cause or to use position for political leverage. This is to be avoided just like any other corrupt system.

The Role of the Public

The public rarely needs to deal with the engineer or try to understand the technology.

The public does need to express needs to the regulator and be open to the proposition that the regulator is competent. The public needs to ask the regulator how compliance with standards is demonstrated. They need to test the regulator and become convinced that the regulator is worthy of their trust.

The public needs to be honest with itself. From their perspective, if the standards are considered a contract then they need to honor the terms of the contract too. If the standards are being met they need to accept the result. If the result is still unacceptable then they need to work with the regulator to change the standard.

Lastly, the public needs to avoid using the regulated hazard as a metaphor for social justice. Similar to the regulator the public might be tempted to use regulation of a particular hazard to further a different agenda. As mentioned above, this invites corruption and is to be avoided.

Conclusion

Most of us would like to change something about the way we are regulated. The back-to-basics approach might serve to provide direction. If we know what we are trying to accomplish and we know what the needs of the other parties are, then we can at least move in that direction. If the public, the regulator and the industry agree on the model then change can occur fairly quickly.

References

A. "The Death of Common Sense, How Law is Suffocating America," by Philip K. Howard, Random House 1994.

B. "Businesslike Government, Lessons Learned from America's Best Companies," Al Gore, National Performance Review, October 1997. www.npr.gov

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REGULATORY REFORM

- Common Sense
- Re-inventing Government
- Back to Basics

REGULATORY RELATIONSHIPS

- Industry (engineer/designer, manufacturer, operator, safety analyst)
- Regulator
- Public

Regulatory Logic

- We work with hazardous materials or operations.
- There is some benefit from working with these hazards (else we'd just avoid them).
- We need acceptance from the general public to this work.
- The public wants to be protected from the hazards.
- The public doesn't understand the hazards or the risks.
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Regulatory Logic

- That third party would have to be knowledgeable of the hazard, and
- The third party would have to consider the best interests of the public.
- The public would have to be convinced that their interests are being considered and that the third party is knowledgeable.
- The third party must want to balance the conditions placed on the work and risks so that the benefits of the work can be realized.

Conclusion

- Like ISM
- Back-to Basics
- Clear Relationships
- Will take time - But